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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09 855,806	05/16/2001	Masami Akimoto	OMY-010	1549

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EXAMINER
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CROWELL, ANNA M

ART UNIT	PAPER NUMBER
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1763

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DATE MAILED: 11/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/855,806

Applicant(s)

AKIMOTO ET AL.

Examiner

Michelle Crowell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on September 10, 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) 1,5-10 and 12-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1,5-10 and 12-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 12-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claim 12, the last two paragraphs reciting the following are unclear:

A first delivering and receiving portion delivering and receiving the substrate having a relation to the solution type processing between the second substrate processing portion and the first substrate processing portion; and

A second delivering and receiving portion delivering and receiving the substrate having no relation to the solution type processing between the first substrate transferring portion and the first substrate processing portion.

The use of the term "relation to" is unclear.

How does the first deliver and receiving portion have a relation to the solution type processing between the second substrate processing portion and the first substrate processing portion?

The terms "first and second processing portions" are unclear. Are these separate chambers? Or are the first and second processes taking place in one chamber?

How does the second deliver and receiving portion have no relation to the solution type processing between the first substrate transferring portion and the first substrate processing portion?

How does the first substrate transferring portion relate to the first substrate processing portion?

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh et al. (U.S. 6,110,011) in view of Kondo et al. (U.S. 5,303,671).

Referring to Figure 5 and column 6, lines 20-47, and column 7, lines 50-64, Somekh discloses a cluster tool apparatus used to deposit a metal layer by electrodeposition and then polish the layer by chemical mechanical polishing (CMP) in a reduced pressure environment. A central substrate-handling robot 18' (carrier in a reduced pressure environment) transfers the substrate between the electrodeposition stations 14 (conductive film forming chamber) where the conductive film copper (oxidization-prone film) is deposited on the substrate, the CMP apparatus 16' (polishing chamber), dual load lock chamber 80, rinse clean/dry station 82 (cleaning chamber), and the metrology station 86. In the rinse/clean/dry station 82, a combination of a brush/scrub cleaner with a centrifugal drier or a rinse bath with an isopropyl alcohol (IPA) vapor

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drier may be used. Alternately, drying may occur in the load lock chamber 80 (drying chamber) using a heater 98 and air jets from nozzles 100.

Somekh fails to teach a drying chamber with a first and second transferring ports and a CVD chamber.

Referring to Figure 9, column 6, line 22 – column 7, line 1, and column 7, lines 36-47, Kondo teaches a multi-processing chamber which includes the following units: washing unit 80, rinsing unit 90, drying unit 70 or 500, and CVD film forming unit 200. The heating and drying chamber 500 heats the wafer using infrared ray lamps 503. In addition, nitrogen gas (inert gas) is supplied drying chamber via gas blowing conduit 501. Inert gases are used drying since they do not react with wafer or chamber. After the wafer leaves the heating and drying chamber 500, wafer carrier mechanism 31a transfers the wafer into the CVD process tube 2 (CVD film form chamber). The drying chamber 500 includes two gates G3 and G4 (first and second transferring port which allows various processing to take place before and after the drying process. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the drying chamber of Somekh with the drying chamber and CVD chamber of Kondo. This would allow an inert gas to be used to dry the wafer without reacting with the wafer. In addition, after the drying stage, further processing of the wafer can take place in order to yield the desired product

5. Claims 5-8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh et al. (U.S. 6,110,011) in view of Kondo et al. (U.S. 5,303,671) as applied to claims 1 and 2 above, and further in view of Hashimoto (Japanese Patent Publication 07-183299).

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The teachings of Somekh in view of Kondo have been applied above.

Somekh in view of Kondo fail to teach a conductive film formed with an insulating film having a recessed portion embedded with the conductive film.

Referring to the abstract, constitution, and Figure 1, Hashimoto teaches a groove (recess) formed in an insulating film 2 of a silicon substrate 1. Next, a copper film 4 is deposited over the insulating film to embed the groove. It would have been obvious to one of ordinary skill in the art at the time of the invention for the substrate of Somekh in view of Kondo to have an insulating film with groove as taught by Hashimoto. It is standard procedure to form fine copper wirings by embedding a copper film in a groove of an insulating film.

Claim 8 only differs from Somekh in view of Kondo in reciting that there is a plurality of drying chambers while Somekh only teaches one drying chamber. It is well settled that the mere duplication of parts has no patentable significance unless a new and unexpected result is produced. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Somekh with a plurality of drying chambers.

6. Claims 12, 13 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh et al. (U.S. 6,110,011) in view of Kondo et al. (U.S. 5,303,671) as applied to claims 1 and 9 above, and further in view of Soraoka et al. (U.S. 5,855,726).

The teachings of Somekh in view of Kondo have been applied above

Somekh in view of Kondo fail to show a first substrate carrier and a second substrate carrier.

Regarding Claims 12, 17, and 18

Referring to Figure 3, and column 5, lines 31-61, Soraoka shows an atmospheric transfer robot 9 (first substrate carrier) that moves along rail 92 to transfer samples from cassettes 12A-D to load lock chambers 4 and 5. In addition, vacuum transfer robot 10 (third substrate carrier) moves samples from the load chambers 4 and 5 to the processing chamber 6 and post-treating chamber 7. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the processing chambers of Somekh in view of Kondo with the atmospheric transfer robot and vacuum transfer robot as shown by Soraoka. This would allow wafers to be transferred to/from a processing chamber.

Claim 17 only differs from Soraoka in reciting that there is a second atmospheric substrate carrier while Somekh only teaches one atmospheric substrate carrier. It is well settled that the mere duplication of parts has no patentable significance unless a new and unexpected result is produced. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Somekh with two atmospheric substrate carriers. The second substrate carrier would be placed in the location that would maximize processing efficiency. Therefore, having two substrate carriers would increase throughput.

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh et al. (U.S. 6,110,011) in view of Kondo et al. (U.S. 5,303,671), and Soraoka et al. (U.S. 5,855,726) as applied to claims 1, 9, 12, 17, and 18 above, and further in view of Henley et al. (U.S. 6,153,524).

The teachings of Somekh in view of Kondo have been applied above.

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Somekh in view of Kondo fail to show an etch chamber.

Referring to Figure 3 and column 11, lines 2-9, lines 20-25, Henley teaches that it is known to use an etch chamber in a multiprocessing apparatus. The etching chamber can etch a desired pattern on a substrate layer. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Somekh in view of Kondo and Soraoka with a CVD chamber and etching chamber as taught by Henley. This would allow substrate to be etched in order to yield the desired product.

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh et al. (U.S. 6,110,011) in view of Kondo et al. (U.S. 5,303,671), and Soraoka et al. (U.S. 5,855,726) as applied to claims 1, 9, 12, 17, and 18 above, and further in view of DeOrnellas (U.S. 5,672,239).

The teachings of Somekh in view of Kondo have been applied above.

Somekh in view of Kondo fail to show resist removing chamber.

Referring to Figure 2 and column 4, lines 9-11, DeOrnellas teaches a strip module 24 (resist removing chamber) which uses oxygen plasma to strip the photoresist on the wafer. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the apparatus of Somekh with the strip module as taught by DeOrnellas. This would allow the photoresist film to be removed after substrate processing.



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*Response to Arguments*

9. Applicant's arguments with respect to claims 1, 5-10, and 12-18 have been considered but are moot in view of the new ground(s) of rejection.

*Conclusion*

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure..

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (703) 305-1956. The examiner can normally be reached on M-F (8:00 - 4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC  
November 18, 2002

